

CLAIMS

1. A portable automatic dishwasher detergent dispensing device comprising a body enclosing a detergent or detergent additive, sufficient for a plurality of wash cycles, the body having an inlet aperture to allow wash liquor to contact the detergent and an outlet aperture to allow the detergent loaded wash liquor to exit the body and means to close the one or both of the apertures at or before the start of the dishwasher rinse cycle.

2. A portable automatic dishwasher detergent dispensing device comprising a body enclosing a detergent or detergent additive, sufficient for a plurality of wash cycles, the body having an outlet aperture to allow the detergent to exit the body and means to close the outlet aperture at or before the start of the dishwasher rinse cycle.

3. A device according to claim 1 or 2, wherein the closing means reacts to a change in the conditions of the dishwasher during the dishwasher washing cycle.

4. A device according to claim 3, wherein the closing means reacts to a change in temperature during the dishwasher washing cycle.

5. A device according to claim 4, wherein the closing means comprises a thermal activator such as a thermal bimetal (including conventional thermal bimetals and thermal bimetal snap elements), a wax activator or a shape memory alloy.

6. A device according to claim 5, wherein the thermal bimetal snap element moves a plug between a position in which at least one of the inlet and / or outlet apertures is closed to a position in which at least one of the inlet and / or outlet apertures is open.

7. A device according to claim 6, wherein the thermal bimetal snap element has a higher snap temperature of between 30 to 50°C, more preferably between 35 to 45°C and most preferably about 40°C.

8. A device according to claim 6 or 7, wherein the thermal bimetal snap element has a lower snap temperature of about 20 to 35°C, more preferably between 23 to 27°C and most preferably about 25°C.

9. A device according to claim 5, 6, 7 or 8, wherein the thermal bimetal snap element is in the form of a strip.

10. A device according to claim 9, wherein a first portion of the thermal bimetal snap element is attached to / liases with the device and a second portion of the thermal bimetal snap element is attached to / liases with the plug.

11. A device according to claim 5, 6, 7 or 8, wherein the thermal bimetal snap element is in the form of a two dimensional shape.

12. A device according to claim 11, wherein the thermal bimetal snap element is retained in the device such that one or more of the peripheries of the thermal bimetal snap

element interacts with the plug and the device, moving the plug relative to the device.

13. A device according to claim 12, wherein the thermal bimetal snap element is mounted on a plate in the device.

14. A device according to claim 13, wherein the mounting means includes a rod extending from the plug which intersects the thermal bimetal snap element.

15. A device according to claim 14, wherein the rod has a terminal flange to retain the thermal bimetal snap element / interact therewith.

16. A device according to any one of claims 1 to 5, wherein the closing means comprises a plurality of thermal bimetals.

17. A device according to claim 16, wherein the device comprises a primary thermal bimetal which affects the interaction of a plug with the inlet / outlet aperture and a secondary thermal bimetal which affects the operation of the primary thermal bimetal.

18. A device according to claim 17, wherein the primary thermal bimetal is a conventional thermal bimetal having an activation temperature of about 40°C.

19. A device according to claim 17 or 18, wherein the secondary thermal bimetal comprises a thermal bimetallic snap element having a higher snap temperature of about 40°C and a lower snap temperature of about 25°C.

20. A device according to claim 1, 2 or 3, wherein the closing means reacts to the presence of water / humidity in the dishwasher.

21. A device according to claim 20, wherein the closing means swells upon contact with water causing the closing of one or both of the inlet and / or outlet apertures.

22. A device according to any one of claims 1 to 21, wherein the device comprises a auxiliary chamber disposed adjacent the main body of the device external to the inlet and / outlet apertures.

23. A device according to claim 22, wherein the auxiliary chamber comprises a closure means which associates with an access opening.

24. A device according to claim 23, wherein the closure means comprises a thermal bimetal.

25. A device according to claim 22, wherein the device is for use in the dispense of a liquid/powder detergent formulation.

26. A device according to claim 25, wherein the auxiliary chamber access opening closure means operates in synchronisation with the closure means of the outlet of the main body.

27. A device according to claim 26, wherein a linkage is disposed between the auxiliary closure means and the main body closure means.

28. A device according to claim 27, wherein the device comprises a second linkage accessible by a user from the exterior of the device.

29. A device in accordance with any one of claims 1 to 28, wherein the device comprises a second means to control the amount of wash liquor which enters the inlet aperture.

30. A device in accordance with claim 29, wherein the means comprises a collecting funnel.

31. A device in accordance with claim 30, wherein the collecting funnel has a drainage opening in its collecting portion.

32. A device in accordance with any one of claims 1 to 31, wherein the body comprises a water-resistant / water insoluble material.

33. A device in accordance with claim 32, wherein the body comprises a channel which is in communication with the inlet aperture.

34. A device in accordance with claim 33, wherein the channel has a bar of detergent disposed therein with the detergent bar completely filling at least a portion of the channel across the entire bore thereof.

35. A device in accordance with claim 34, wherein the channel has a uniform bore, in terms of the cross sectional area of the bore, along its length / at least along the portion filled by the detergent bar.

36. A device in accordance with claim 35, wherein the channel is a tube.

37. A portable automatic dishwasher detergent additive dispensing device comprising a body enclosing a detergent additive, sufficient for a plurality of wash cycles, the body having an inlet aperture to allow wash liquor to contact the detergent and an outlet aperture to allow the detergent loaded wash liquor to exit the body and means to open one or both of the apertures at or after the start of the dishwasher rinse cycle.

38. A device in accordance with claim 37, wherein the detergent additive is a anti-spotting composition or a glass corrosion prevention composition.

39. The use of an automatic washing machine detergent dispensing device in accordance with any one of claims 1 to 38.

40. An automatic washing machine detergent dispensing device as illustrated in accompanying Figures 3 , 4, 6, 7, 9 and 10.